In speaking on *the necessity for ventilation*, it was shewn that 10 cubic feet of air, or a volume double the size of the person breathing, is required, for the purposes of respiration and transpiration, every minute. The circulation of the blood was described as the process of carbonization. Respiration as the process of decarbonization in the 170 millions of air cells, forming a surface thirty times as large as that of the skin. In the process of transpiration, the so called insensible perspiration was continually given off, which together with the vapour expelled from the lungs, amounted to two fluid ounces every hour. Thus 500 people in a church during two hours, give off fifteen gallons of water into the air, which if not carried away, saturates every thing in the building after it has been breathed over and over again in conjunction with the impurities it contains collected from each individual. The use of lamps, gas, and oil, was shewn to deteriorate the air and to add much moisture to it.

The effects of neglect in carrying out plans for ventilation, are shewn in the production of three of the most formidable and frequent diseases which affect the human race,—fever, scrofula, and consumption. Numerous facts were adduced in proof of this view, and the way in which these diseases were produced was pointed out. Thus, it was shewn, that all those who were immolated in the Black Hole of Calcutta, who did not perish from immediate suffocation, died in a short time from putrid fever. The proportion of people dying of consumption who follow in-door occupations, is double that of those who work out of doors: and it increases as the space for labour is more contracted. Dr. Guy has shown that it is more common in the upper parts of large establishments, as printing-houses, &c., where the air is most vitiated. Towns exposed to the wind are much less liable to consumption than those which are well protected and sheltered, and the goitre afflicting the inhabitants of the valleys of the Rhone is produced by a stagnation of air. Instances were cited of schools, in which the mass of the children were scrofulous, and to whom an increased diet, warmer clothing, &c., were not productive of any benefit; and by the aid of proper plans of ventilation the disease disappeared entirely. This result has taken place in the Zoological Gardens, Regent's Park, since the new dens opened to the air have been in use.

It was then shewn, that hitherto there had been a total absence of plans for the supply of pure air in a sufficient quantity, to the abodes of human beings. Towns are erected in localities wholly unadapted for residences; they are constructed so as effectually to exclude the air, and often increase to so large a size as to be rendered from this cause only, most unhealthy.

The last portion of the address was devoted to the consideration of the means to be adopted for securing an efficient ventilation. The example set by nature ought to be followed, and the gentle changes produced by the wind should be as much as possible imitated. The great principle is, to admit into rooms and houses a large quantity of air at a moderate temperature (60° to 65°); and that there should be an outlet for the vitiated air. The pure air to be admitted within three or four feet of the floor, and to be warmed by aid of the fire-place. The various plans for warming the fresh air were examined, and their errors were found to have been, that a small quantity was admitted through a narrow channel, and at a temperature much too high, so that its nature was deteriorated. The subject of warming abodes was also alluded to; and it was shewn, that from the bad mode of construction of stoves and fire-places, and from improper materials being used, the smoke was not consumed, ventilation was rendered impossible, and the greater part of the heat dispersed up the chimney. Mr. Toynbee was happy to say, that he had recently examined some plans about to be patented by a gentleman who had devoted a long life to the subject, and had brought to it great chemical and practical knowledge, in which these evils would be remedied, and important advantages gained.

In speaking of the means for insuring the egress of the vitiated air, it was stated, that as its temperature on escaping from the mouth is between eighty and ninety degrees, it rises to the upper part of the room, from which there should always be a means of escape. Dr. Arnott's valve had been generally used for this purpose, and thousands of people will be indebted to its use for their lives and health. If it were the custom of this country to erect statues in memory of those who, like Jenner, *saved* the lives of thousands of their fellowmen, Dr. Arnott in manifold ways had indeed earned for himself this distinction. A modification of Dr. Arnott's chimney valve, by Daw, a working man, was alluded to and displayed, which had the advantage of always remaining open, unless voluntarily closed. Various suggestions were made, shewing how easily plans of ventilation may be carried out; and Mr. Toynbee concluded his very excellent address by appealing to the architects to carry out efficient plans in the construction of buildings, by doing which they would confer unbounded good upon the public, by improving the public health.

The chairman dwelt at some length on the fact, that there was no mystery in the science of ventilation—all was perfectly simple—the great point was to proportion the means of entrance and exit to the quantity of air required. As regarded decoration, there was more difficulty: the appearance of valves was offensive, and, moreover, the air in drawing through them left black lines around the edges.

The Dean of Westminster alluded to some houses in Edinburgh, ventilated by the late Sir John Robison, where the means of exit for the vitiated air was provided behind the cornices in every room.* The reverend gentleman took occasion to comment on the injury done by the open gully holes in our streets, and blamed the Commissioners of Sewers for not permitting them to be trapped. The necessity for permitting the escape of the bad air from the sewers was no answer. If central shafts were provided at certain intervals, with a single gaslight at the top of each, the sewers would be effectually ventilated, and the public health preserved. Several other gentlemen addressed the meeting at considerable length.

SUPPOSED INJURY TO ELY CATHEDRAL.

In addition to our correspondent's letter, last week, it may be satisfactory to some of our readers to see the following remarks, which have been addressed to the *Athenæum* on the subject:—"The author of some observations, which were given in the *Athenæum* for May 23rd, respecting the works which are in progress in Ely Cathedral, is mistaken in supposing that the octagonal termination of the western tower, and the sub-arches beneath the original Norman work, are cotemporary and parts of the same design. The first was erected about the year 1386; the second were added, by Bishop Gray, about the year 1460; in consequence, as it is surmised, of the tower having sunk bodily through a space of nearly six inches,—occasioning the most extensive ruin of the adjoining wings of the western transept; of which the northern was taken down and the southern (which has been recently opened and restored) was left in a very dangerous state,—the crown of every arch being ruptured and dislocated; and one of the principal pieces, and much of the arcading and ashlaring, completely separated from the rubble filling of the wall. As the Norman piers of the tower are cased with new and very perfect masonry, it is impossible to speculate upon the state to which they were reduced by this subsidence; but the magnificent Norman zigzag arches, which are now partially (to the extent of about three feet in depth out of ten) exposed to view, are perfectly sound, there being only one considerable crack discoverable in them, occasioned by a partial twisting in the settlement of the south-western buttressing turret of the great tower. If any proof were wanting of the confidence of the builder of the sub-arches, in the stability and strength of the Norman arches above them, it would be found in the loose rubble filling,—which was, in three cases out of four, left between them, and which alone has been partially removed in the works which are now in progress.

It may be very readily admitted that the public have a just right to demand, in all works which are executed with a view to the restoration and stability of the great monuments of our ecclesiastical architecture, not merely extreme caution, but also the application of the most matured architectural and engineering skill and experience. We believe the correspondent of the *Athenæum* of the 23rd May, to be mistaken in supposing that the parties concerned in these works have not sought for and obtained the best advice and assistance which they could command. The whole structure of this tower has been most carefully studied and examined;—plans and sections of every part of it have been made;—and the course and extent of every crack in the structure (and they are less considerable and less dangerous than in most other towers of this description) have been, as far as possible, scrutinized and traced;—defective portions of it (particularly in the stage beneath the octagon, where great injuries had been done by unskilful additions subsequent to the restoration), have been carefully rebuilt with solid masonry, and boarded; a timber framing, of great strength, designed to brace together the sides of the tower, which had become not merely useless but injurious, from the rottenness of many of its essential parts, is in the course of restoration to a state of much greater efficiency than it ever before possessed;—and we believe that no precaution has been, or is likely to be, neglected, which is calculated to secure this noble structure, without further injury, to future ages."

We have yet to learn, with certainty, that an architect *has* been employed, and who the architect is.

* One of these houses, we remember, is fully illustrated in "Loudon's Architectural Magazine."

THE STRIKE.

At a meeting of master builders, held at the Portico, Liverpool, on the 3rd of June, the following resolutions were passed:—

1. That having acceded to the benevolent request of Mr. Rushton, to meet a deputation of the working classes, for the purpose of endeavouring to arrange the differences that existed, and it appearing, from the assertion of the representatives of the workmen, that they were duly authorized to adjust those differences, and that the bar to such adjustment was the declaration that they did not, or would not, belong to the General Trades' Union; and the masters having withdrawn that declaration, and it having been agreed upon, in consequence, that work should be resumed on the same terms as before the strike, this meeting feels regret in being obliged to record the fact, that the stipendiary magistrate has been most unfairly and uncourteously dealt with, the arrangement most dishonourably broken, and it was made manifest that no faith can be kept with those who have at present the management and the conduct of the Masons' Club.

2. That this meeting is more than ever strongly impressed with the opinion, that no further communication whatever should be held with the delegates of the clubs; that concession has now reached its utmost limit; and while they are willing to receive their workmen on the same terms as heretofore, they utterly repudiate the principle of club interference between the buyer and seller of labour; and they again pledge themselves to resist such unwarrantable interference; and,

3. That this meeting now considers it a solemn duty, looking at the amount of individual suffering, as well as of local inconvenience, that is likely to result from a renewal of the strike, to call upon all the public bodies, as well as private individuals, to aid them in putting down a combination which repudiates its own acts and assertions, which keeps no faith, and which is exercising a most arbitrary influence over hundreds of workmen who are anxious to proceed with their work, and which, if not checked, must tend still further to increase the misery, destitution, and general inconvenience which are now so severely felt.

The Raising Machine in the General Post Office.—The new machine for raising and lowering the letter-carriers and bags, which we described some time back,* appears to be somewhat uncertain in its operation: a recent accident has led to a partial prohibition of its use. Surely there can be no real difficulty in rendering its operation steady?

* See page 97, *ante*.

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